# Bill of Materials

## 1.1 I/O Board

| Reference | Count | Value | Part Source |
|---|---|---|---|
| **balance1** | 1 | 1M | Alpha 9mm |
| **C1, 4, 11, 14** | 4 | 10n | C2012C0G1H103J060AA |
| **C2, 12** | 2 | 470n | VJ0805Y474JX |
| **C3, 13** | 2 | 47n | VJ0603Y473JX |
| **C6, 8, 9, 10** | 4 | 100n | C0805C1045RAC |
| **cycleSW1, 2** | 2 | SWITCH_INV | 100SP1T1B2M2QE or Tayda |
| **D1-4** | 4 | D | 1N4148WS-E3-08 |
| **fallCvPot1, 2, riseCVPot1, 2, fallPot1, 2, risePot1, 2** | 8 | 100k | Alpha 9mm |
| **Jack** | 24 | 3.5mm | 3.5mm Thonkiconn Jack |
| **ledR1, 2, ledF1, 2** | 4 | LED | LTL-1CHA |
| **Q1-4** | 4 | MMBT3904 | MMBT3904LT1G |
| **R1, 3, 4, 27, 33, 53, 54, 56** | 8 | 10k | RC0805FR-0710KL |
| **R14-16, 23-26, 30-32, 34, 39-41** | 14 | 1k | RC0805FR-071KL |
| **R19, 20, 43, 44** | 4 | 2k2 | AC0805FR-072K2L |
| **R6, 13, 35, 45** | 4 | 47k | RC0805JR-1047KL |
| **R2, 10-12, 21, 22, 38, 42, 46, 49, 51, 55** | 12 | 100k | RC0805FR-07100KL |
| **R8, 18, 37, 48** | 4 | 110k | RC0805FR-07110KL |
| **R7, 17, 36, 47, 57** | 5 | 1M | RC0805FR-071ML |
| **R28, 29** | 2 | 4M7 | RC0805FR-074M7L |
| **R5, 9, 50, 52** | 4 | 23k7 | RC0805FR-0723K7L |
| **rangeSW1, 2** | 2 | SWITCH_INV | 100SP3T1B1M1QEH or Tayda |
| **riseTrim1, 2, fallTrim1, 2** | 4 | 100k | 3362P-1-104LF |
| **shape1, 2** | 2 | 10K | Alpha 9mm Dual (DIP) |
| **symetry1, 2** | 2 | 10k | 3362P-1-103LF |
| **triggerSW1** | 1 | SWITCH_INV | 100SP4T1B1M1QEH or Tayda |
| **U1** | 1 | TL074 | TL074CDR |

## 1.2 Main Board

| Reference | Count | Value | Part Source |
|---|---|---|---|
| **C1, 2** | 2 | 560p | C0805C561J5GAC |
| **C3, 4** | 2 | 100p | VJ0805A101JXAAC |
| **C5, 6, 10-17, 19-28** | 19 | 100n | C0805C1045RAC |
| **C7, 8** | 2 | 2n2(PP) | FKP2D012201D00JI00 |
| **C9, 18** | 2 | 10u | 667-EEE-1HA100SP |
| **D1-23** | 23 | 1n4148 | 1N4148WS |
| **P7** | 1 | *summing jumper | |
| **Q1-4** | 4 | MMBT3904 | MMBT3904LT1G |
| **R1, 2, 40, 41** | 4 | 30k | RC0805FR-0730KL |
| **R20, 22, 36, 38** | 4 | 4k7 | RC0805FR-074K7L |
| **R3** | 1 | 10M | RC0805FR-0710ML |
| **R4, 5, 21, 23, 37, 39, 42-45, 58, 59, 64, 66, 87, 90** | 16 | 10k | RC0805FR-0710KL |
| **R61, 62, 81, 82** | 4 | 110k | RC0805FR-07110KL |
| **R6, 12, 26-35, 46-57, 60, 79, 80, 84** | 28 | 100k | RC0805FR-07100KL |
| **R63, 65** | 2 | 180k | RC0805FR-07180KL |
| **R67** | 1 | 220k | RC0805FR-07220KL |
| **R68-71** | 4 | 2k2 | AC0805FR-072K2L |
| **R7, 11, 13, 17, 24, 25** | 6 | 560k | RC0805FR-07560KL |
| **R72, 73** | 2 | 470k | RC0805FR-07470KL |
| **R75, 77** | 2 | 22k | AC0805FR-0722KL |
| **R78** | 1 | *summing resistor | RC0805FR-07100KL |
| **R8, 10, 14, 16** | 4 | 3M | RC0805FR-073ML |
| **R83** | 1 | 20k | RC0805FR-0720KL |
| **R85, 86, 88, 89** | 4 | 1k | RC0805FR-071KL |
| **R9, 15, 18, 19, 74, 76** | 6 | 1M | RC0805FR-071ML |
| **R91, 92** | 2 | 10r | AC0805FR-0710RL |
| **T1, 3** | 2 | BCM857DS | BCM857DS135 |
| **T2, 4** | 2 | BCM847DS | BCM847DS135 |
| **U1-8** | 8 | TL074 | TL074CDR |
| **U9** | 1 | AD633 | AD633ARZ |

*For summing leave off AD633 and populate R78 and R67 with 100kohm. Also put a jumper across P7.

*C29, 30 can be used instead of C7, 8 for main timing capacitor with SMD part.